



Approval

TFT LCD Approval Specification

Model No.: V260B3-LE1

| Customer: |
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| Approved by: |
| Note: |
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Approval

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| | Model No | o.: V260B | 3-LE |
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| 11.1 SAFET | Y | | 33 |
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| 12. MECHANICAL | CHARACTERISTIC | | 34 |





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REVISION HISTORY

| Varaian | Data | Page | Conting | Description |
|---------|-------------|---------------|---------|--|
| Version | Date | Page (New) | Section | |
| | Apr. 29,'10 | All | All | Approval Specification was first issued. |





Approval

1. GENERAL DESCRIPTION

1.1 OVERVIEW

V260B3-LE1 is a TFT Liquid Crystal Display module with LED Backlight unit and 1ch-LVDS interface. The display diagonal is 26". This module supports 1366 x 768 WXGA format and can display 16.7M colors (8-bit/color).

1.2 FEATURES

- Optimized Brightness 400nits
- Contrast Ratio (3000:1)
- Fast Response Time (Gray to Gray Average 8.5ms)
- Color Saturation NTSC 72%
- WXGA (1366 x 768 pixels) Resolution
- DE (Data Enable) Only Mode
- LVDS (Low Voltage Differential Signaling) Interface
- Viewing Angle: 176(H)/176(V) (CR>20) MVA Technology
- Color Reproduction (Nature Color)

1.3 APPLICATION

- -TFT LCD TVs
- -Optimized Brightness, Multi-Media Displays

1.4 GENERAL SPECIFICATIONS

| Item | Unit | Note | |
|--|--|-------|-----|
| Active Area | 575.769 (H) x 323.712 (V) (26" Diagonal) | mm | (1) |
| Bezel Opening Area | 580.2 (H) x 328.2 (V) | mm | (1) |
| Driver Element | a-si TFT Active Matrix | - | - |
| Pixel Number | 1366 x R.G.B. x 768 | pixel | - |
| Pixel Pitch(Sub Pixel) 0.1405 (H) x 0.4215 (V) | | mm | - |
| Pixel Arrangement | RGB Vertical Stripe | - | - |
| Display Colors | 16.7M | color | - |
| Display Operation Mode | Transmissive Mode / Normally Black | - | - |
| Surface Treatment | Anti-Glare Coating (Haze 11%) Hard Coating (3H) | - | |

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

1.5 MECHANICAL SPECIFICATIONS

| l1 | tem | Min. | Тур. | Max. | Unit | Note |
|------------------|--------------|------|------|------|--------------|-------------|
| Horizontal (H) | | 612 | 613 | 614 | mm | Module Size |
| Module Size | Vertical (V) | 360 | 361 | 362 | mm | |
| Weight Depth (D) | Donth (D) | 9.3 | 10.3 | 11.3 | mm | To Rear |
| | 16 | 17 | 18 | mm | To CNV Cover | |
| | Weight | | 2650 | | g | |



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CHIMEI INNOLUX

2. ABSOLUTE MAXIMUM RATINGS

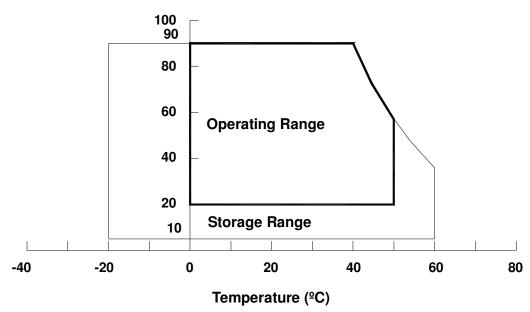
2.1 ABSOLUTE RATINGS OF ENVIRONMENT

| Item | Symbol | V | alue | Unit | Note |
|-------------------------------|---------------------|------|------|-------|----------|
| item | Symbol | Min. | Max. | Ullit | Note |
| Storage Temperature | T _{ST} | -20 | +60 | ōC | (1) |
| Operating Ambient Temperature | T_OP | 0 | 50 | ∘C | (1), (2) |
| Shock (Non-Operating) | ±X, ±Y | | 50 | G | (3), (5) |
| Shock (Non-Operating) | S _{NOP} ±Z |] | 50 | l G | (3), (3) |
| Vibration (Non-Operating) | V_{NOP} | - | 1.0 | G | (4), (5) |

Note (1) Temperature and relative humidity range is shown in the figure below.

- (a) 90 %RH Max. (Ta \leq 40 $^{\circ}$ C).
- (b) Wet-Bulb temperature should be 39 °C Max. (Ta > 40 °C).
- (c) No condensation.
- Note (2) The maximum operating temperature is based on the test condition that the surface temperature of display area is less than or equal to 65 °C with LCD module alone in a temperature controlled chamber. Thermal management should be considered in final product design to prevent the surface temperature of display area from being over 65 °C. The range of operating temperature may degrade in case of improper thermal management in final product design.
- Note (3) 11 ms, half sine wave, 1 time for $\pm X$, $\pm Y$, $\pm Z$.
- Note (4) 10 \sim 200 Hz, 10 min, 1 time each X, Y, Z.
- Note (5) At testing of Vibration and Shock, the fixture in holding the module has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.

Relative Humidity (%RH)







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2.2 ELECTRICAL ABSOLUTE RATINGS

2.2.1 TFT LCD MODULE

| Itom | Symbol | Va | lue | Unit | Note |
|----------------------|--------|------|------|-------|------|
| Item | Symbol | Min. | Max. | Ullit | Note |
| Power Supply Voltage | Vcc | -0.3 | 13.5 | V | (1) |
| Input Signal Voltage | VIN | -0.3 | 3.6 | V | (1) |

2.2.2 BACKLIGHT CONVERTER UNIT

| Item | Symbol | Test Condition | Min. | Туре | Max. | Unit | Note |
|-------------------------|----------------|-------------------|------|------|------|-----------|------|
| Light Bar Voltage | V _W | Ta = 25 °C | - | - | 40.8 | V_{RMS} | |
| Converter Input Voltage | V_{BL} | - | 0 | - | 30 | V | |
| Control Signal Level | - | - | -0.3 | - | 7 | V | |

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Functional operation should be restricted to the conditions described under Normal Operating Conditions.





Approva

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

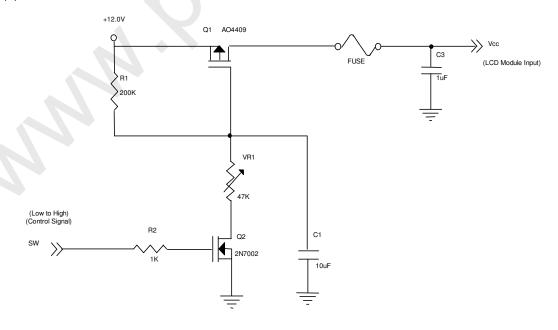
Global LCD Panel Exchange Center

 $Ta = 25 \pm 2 \, ^{\circ}C$

| | Parame | otor | Symbol | | Value | Unit | Note | | | | | | | | | |
|-------------------|---------------------------------|---------------------------|-------------------|----------------------------|-------------|-----------------------------|-------|----------------------------|--|-----------------------------|--|-----|---|-----|---|--|
| | Farame | elei | Symbol | Min. | Тур. | Max. | Offic | Note | | | | | | | | |
| Power Sup | oply Voltage | | V _{CC} | 10.8 | 12 | 13.2 | V | (1) | | | | | | | | |
| Rush Curre | ent | | I _{RUSH} | _ | _ | 2.53 | Α | (2) | | | | | | | | |
| | | White Pattern | _ | _ | 0.45 | | А | | | | | | | | | |
| Power Sup | pply Current | nt Horizontal Stripe | | _ | 0.56 | 0.65 | А | (3) | | | | | | | | |
| | | Black Pattern | _ | _ | 0.36 | | Α | | | | | | | | | |
| | Differential Ir Threshold Vo | | V_{LVTH} | +100 | \- [| \(\pi \) | mV | | | | | | | | | |
| | Differential Ir Threshold Vo | put Low | V_{LVTL} | - | | -100 | mV | | | | | | | | | |
| LVDS interface | Common Inp | ut Voltage | V _{CM} | 1.0 | 1.2 | 1.4 | V | (4) | | | | | | | | |
| | Differential in (Single-End) | put voltage | V _{ID} | 200 | _ | 600 | mV | | | | | | | | | |
| | Terminating I | Resistor | R _T | - | 100 | _ | ohm | | | | | | | | | |
| CMOS | Input High Th | ut High Threshold Voltage | | put High Threshold Voltage | | nput High Threshold Voltage | | out High Threshold Voltage | | nput High Threshold Voltage | | 2.7 | _ | 3.3 | V | |
| interface | Input Low Th | reshold Voltage | V _{IL} | 0 | _ | 0.7 | V | | | | | | | | | |

Note (1) The module should be always operated within above ranges.

Note (2) Measurement Condition as below:

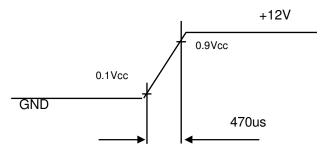




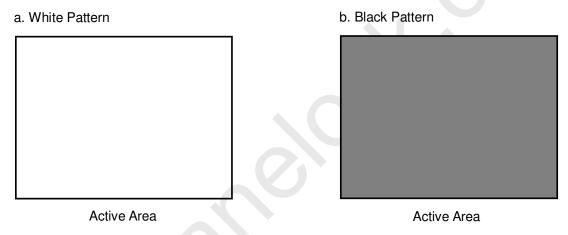


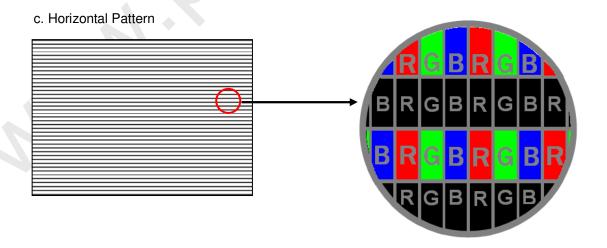
Approval

Vcc rising time is 470us



Note (3) The specified power supply current is under the conditions at Vcc = 12 V, $Ta = 25 \pm 2 \,^{\circ}\text{C}$, $f_v = 60 \,^{\circ}\text{Hz}$, whereas a power-dissipation checking pattern is displayed as below.

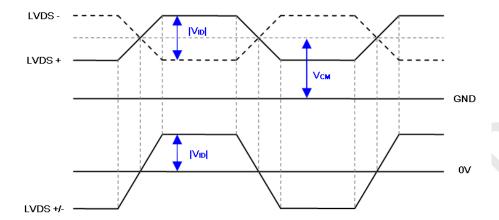






Approval

Note (4) The LVDS input characteristics are as follows:



3.2 BACKLIGHT UNIT

3.2.1 LED LIGHT BARCHARACTERISTICS (Ta = 25 ± 2 °C)

| Parameter | Symbol | | Value | | Unit | Note |
|-------------------|----------------|-----------|-------|------|-------------------|----------------------|
| Farameter | Symbol | Min. Typ. | | Max. | Offic | Note |
| Light Bar Voltage | V _W | - | - | 40.8 | V_{RMS} | $I_L = 80 \text{mA}$ |
| Forward Voltage | V_{f} | - | 3.1 | 3.4 | V_{RMS} | $I_L = 80 \text{mA}$ |
| LED Current | IL | 75.2 | 80 | 84.8 | mA _{RMS} | |
| LED lifetime | hr | 30,000 | - | - | hrs | (1) |

Note (1) The lifetime is defined as the time which luminance of the LED decays to 50% compared to the initial value, Operating condition: Continuous operating at Ta = $25\pm2^{\circ}$ C, I_L =80mA

3.2.2 CONVERTER CHARACTERISTICS (Ta = 25 ± 2 $^{\circ}$ C)

| Parameter | Symbol | | Value | | Unit | Note |
|-------------------------|-----------|------|-----------|------|----------|------|
| Farameter | Syllibol | Min. | Тур. Мах. | | Offic | Note |
| Power Consumption | P_BL | - | 29 | 33 | W | |
| Converter Input Voltage | V_{BL} | 22.8 | 24 | 25.2 | V_{DC} | |
| Converter Input Current | I_{BL} | - | 1.2 | 1.4 | Α | |
| Dimming Frequency | F_B | 150 | 160 | 170 | Hz | |
| Minimum Duty Ratio | D_{MIN} | 5 | 10 | - | % | (1) |

Note (1) 5% minimum duty ratio is only valid for electrical operation.





Approval

3.2.3 CONVERTER INTERFACE CHARACTERISTICS

| Parameter | | Symbol | Test | | Value | | Unit | Note |
|---------------------------|----------|------------------|-----------|------|-------|------|---|-----------------|
| Parameter | | Symbol | Condition | Min. | Тур. | Max. | Offit | Note |
| On/Off Control Voltage | ON | VBLON | | 2.0 | _ | 5.0 | V | |
| On Control Voltage | OFF | VBLOIN | | 0 | _ | 0.8 | > | |
| Internal PWM Control | MAX | VIPWM | | 3.0 | 3.15 | 3.3 | > | Max. Duty Ratio |
| Voltage | MIN | VII VVIVI | | | 0 | | > | Min. Duty Ratio |
| External PWM Control | НІ | VEPWM | | 2.0 | _ | 5.0 | V | Duty on |
| Voltage | LO | V LI VVIVI | | 0 | _ | 0.8 | ٧ | Duty off |
| Error Signal | ERR | I | | _ | | l | Abnormal: Open Collector Normal: GND (4) | |
| VBL Rising Time | Tr1 | _ | 30 | | _ | ms | 10%-90%V _{BL} | |
| VBL Falling Time | | Tf1 | - | 30 |) – | _ | ms | 1078-3078 V BL |
| Control Signal Rising Tir | me | Tr | 7 | | _ | 100 | ms | |
| Control Signal Falling Ti | me | Tf | |) – | _ | 100 | ms | |
| PWM Signal Rising Time | е | TPWMR | | _ | _ | 50 | us | |
| PWM Signal Falling Tim | е | TPWMF | _ | _ | _ | 50 | us | |
| Input Impedance | | Rin | _ | 1 | _ | _ | МΩ | |
| PWM Delay Time | | TPWM | | 100 | _ | _ | ms | |
| BLON Delay Time | \ | T _{on} | _ | 300 | _ | _ | ms | |
| DLON Delay Time | | T _{on1} | _ | 300 | _ | _ | ms | |
| BLON Off Time | | Toff | _ | 300 | _ | _ | ms | |

- Note (1) The Dimming signal should be valid before backlight is turned on by BLON signal. It is inhibited to change the internal/external PWM signal during backlight had been turned on period.
- Note (2) The power sequence and control signal timing is shown in the following figure. For a certain reason, the converter is possible to be damaged with wrong power sequence and control signal timing.
- Note (3) While system is turned ON or OFF, the power sequences must follow below descriptions:

Turn ON sequence: VBL → PWM signal → BLON

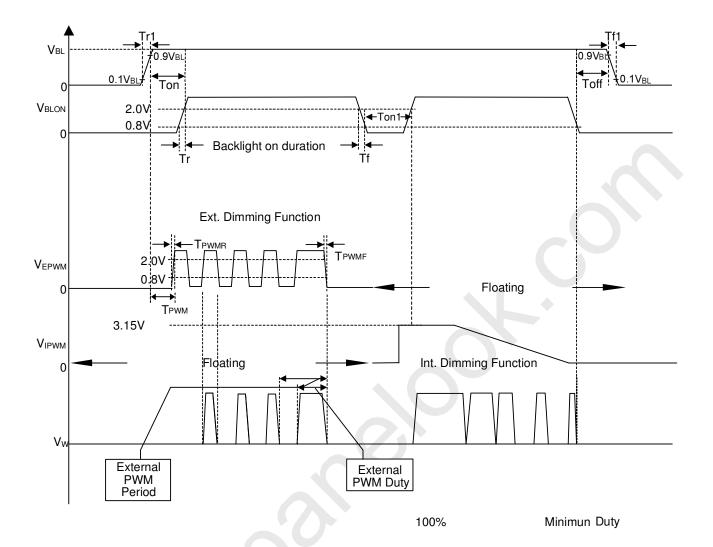
Turn OFF sequence: BLOFF → PWM signal → VBL

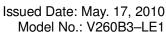
Note (4) When the protective function of converter is triggered, ERR will output at open collector status.





Approval



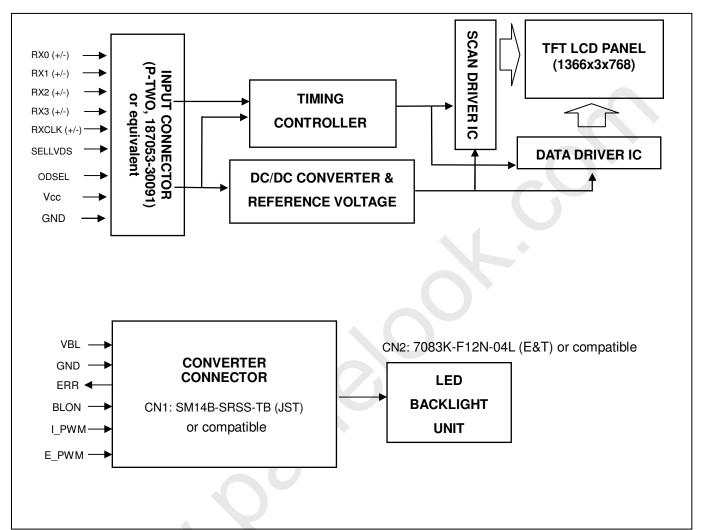




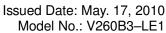


4. BLOCK DIAGRAM OF INTERFACE

4.1 TFT LCD MODULE











5. INTERFACE PIN CONNECTION

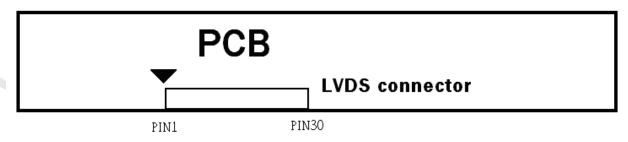
5.1 TFT LCD MODULE

CNF1 Connector Pin Assignment

| Pin No. | Symbol | Description | Note |
|---------|---------|---------------------------------------|---------|
| 1 | VCC | Power supply: +12V | |
| 2 | VCC | Power supply: +12V | |
| 3 | VCC | Power supply: +12V | |
| 4 | VCC | Power supply: +12V | |
| 5 | GND | Ground | |
| 6 | GND | Ground | |
| 7 | GND | Ground | |
| 8 | NC | No connection | (4) |
| 9 | SELLVDS | Select LVDS data format | (2),(5) |
| 10 | ODSEL | Overdrive Lookup Table Selection | (3),(5) |
| 11 | GND | Ground | |
| 12 | RX0- | Negative transmission data of pixel 0 | |
| 13 | RX0+ | Positive transmission data of pixel 0 | |
| 14 | GND | Ground | |
| 15 | RX1- | Negative transmission data of pixel 1 | |
| 16 | RX1+ | Positive transmission data of pixel 1 | |
| 17 | GND | Ground | |
| 18 | RX2- | Negative transmission data of pixel 2 | |
| 19 | RX2+ | Positive transmission data of pixel 2 | |
| 20 | GND | Ground | |
| 21 | RXCLK- | Negative of clock | |
| 22 | RXCLK+ | Positive of clock | |
| 23 | GND | Ground | |
| 24 | RX3- | Negative transmission data of pixel 3 | |
| 25 | RX3+ | Positive transmission data of pixel 3 | |
| 26 | GND | Ground | |
| 27 | NC | No connection | (4) |
| 28 | NC | No connection | (4) |
| 29 | NC | No connection | (4) |
| 30 | GND | Ground | |

Note (1) Connector Part No.: P-TWO, 187053-30091 or compatible

The pin order of LVDS connector is defined as follows



Note (2) Low = Open or connect to GND: VESA Format, High = Connect to +3.3V: JEIDA Format.

Please refer to 5.5 LVDS INTERFACE





Approva

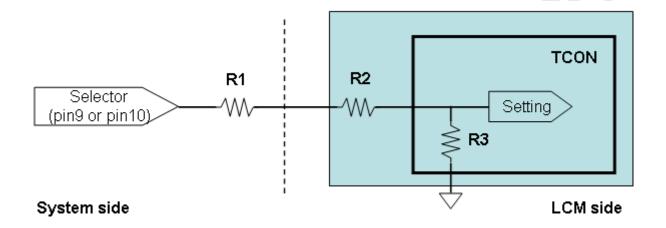
Note (3) Overdrive lookup table selection. The Overdrive lookup table should be selected in accordance to the frame rate to optimize image quality.

Low = Open or connect to GND, High = Connect to +3.3V

| ODSEL Note | | | | | | | |
|------------|--|--|--|--|--|--|--|
| L or Open | Lookup table was optimized for 60 Hz frame rate. | | | | | | |
| Н | Lookup table was optimized for 50 Hz frame rate. | | | | | | |

- Note (4) Reserved for internal use. Let it open.
- Note (5) LVDS signal pin connected to the LCM side followed the following diagram.

R1 in the system side should be less than 1K Ohm. (R1 < 1K Ohm)









5.2 BACKLIGHT UNIT

The pin configuration for the housing and the leader wire is shown in the table as below.

CN: 7083K-F12N-04L (E&T) or compatible

| Pin № | Symbol | Feature |
|-------|--------|------------------------|
| 1 | VLED+1 | Positive of LED String |
| 2 | VLED+2 | Positive of LED String |
| 3 | NC | NC |
| 4 | NC | INC |
| 5 | VLED- | |
| 6 | VLED- | |
| 7 | VLED- | |
| 8 | VLED- | Negative of LED String |
| 9 | VLED- | Negative of LED String |
| 10 | VLED- | |
| 11 | VLED- | |
| 12 | VLED- | |

5.3 CONVERTER UNIT

CN1 (Header): SM14B-SRSS-TB (JST) or compatible

| Pin № | Symbol | Feature |
|-------|--------|--|
| 1 | | |
| 2 | | |
| 3 | VBL | +24V |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | GND | GND |
| 9 | | |
| 10 | | |
| 11 | ERR | Normal (GND) Abnormal (Open collector) |
| 12 | BLON | BL ON/OFF |
| 13 | I_PWM | Internal PWM Control |
| 14 | E_PWM | External PWM Control |

Note (1) PIN 13: Internal PWM Control (Use Pin 13): Pin 14 must open.

Note (2) PIN 14: External PWM Control (Use Pin 14): Pin 13 must open.

Note (3) Pin 13 (I_PWM) and Pin 14 (E_PWM) can't open in the same period.







CN2 (Header): 7083K-F12N-04L (E&T) or compatible

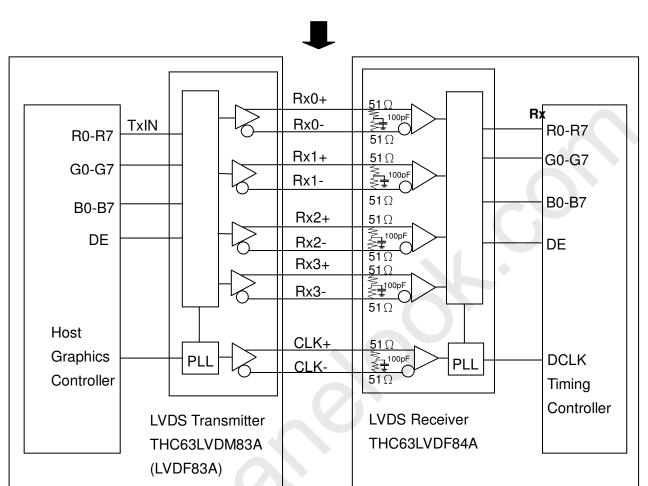
| Pin № | Symbol | Feature |
|-------|--------|------------------------|
| 1 | VLED+1 | Positive of LED String |
| 2 | VLED+2 | Positive of LED String |
| 3 | NC | NC |
| 4 | NC | INC |
| 5 | VLED- | |
| 6 | VLED- | |
| 7 | VLED- | |
| 8 | VLED- | Negative of LED String |
| 9 | VLED- | Negative of LED String |
| 10 | VLED- | |
| 11 | VLED- | |
| 12 | VLED- | |





5.4 BLOCK DIAGRAM OF INTERFACE

CNF1

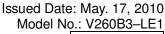


R0~R7 : Pixel R Data G0~G7 : Pixel G Data B0~B7 : Pixel B Data

DE : Data Enable Signal
DCLK : Data clock signal

Note (1) The system must have the transmitter to drive the module.

Note (2) LVDS cable impedance shall be 50 ohms per signal line or about 100 ohms per twist-pair line when it is used differentially.

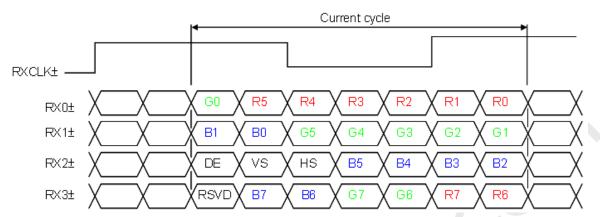




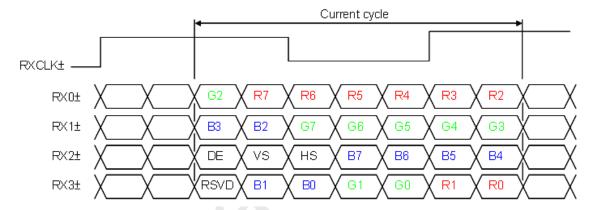


5.5 LVDS INTERFACE

VESA LVDS format: (SELLVDS pin=L or open)



 $\label{eq:JEDIALVDS} JEDIALVDS \ format: (SELLVDS \ pin=H)$



R0~R7: Pixel R Data (7; MSB, 0; LSB) G0~G7: Pixel G Data (7; MSB, 0; LSB)

B0~B7: Pixel B Data (7; MSB, 0; LSB)

DE: Data enable signal

Notes (1) RSVD (reserved) pins on the transmitter shall be "H" or ("L" or OPEN)







5.6 COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color. The higher the binary input, the brighter the color. The below table provides the assignment of the color versus data input.

| | | | | | | | _ | | | | | Da | ta S | igna | <u>.l_</u> | | | | | | | | | | |
|---------------|-----------------|----|----|----|-----|----|----|----|----|----|----|----|------|------|------------|----|----|----|----|----|----|-----|----|----|---|
| | Color | | | | Red | d | | | | | | | Gre | een | | | | | | | В | lue | | | |
| | | R7 | R6 | R5 | R4 | R3 | R2 | R1 | R0 | G7 | G6 | G5 | G4 | G3 | G2 | G1 | G0 | В7 | В6 | B5 | B4 | ВЗ | B2 | B1 | В |
| | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Red | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C |
| | Green | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| Basic | Blue | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Colors | Cyan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| | Magenta | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| | Yellow | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| | White | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Red(0) / Dark | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| | Red(1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| Gray | Red(2) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| Gray Scale | : | : | : | : | : | : | : | : | : | : | : | | | • | : | : | : | : | : | : | : | : | : | : | |
| Of | : | : | : | : | : | : | : | : | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | |
| | Red(253) | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| Red | Red(254) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| | Red(255) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| | Green(0) / Dark | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| | Green(1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| Grov | Green(2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| Gray Scale | : | : | : | : | | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | |
| Of | : | : | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | |
| Green | Green(253) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| Green | Green(254) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| | Green(255) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| | Blue(0) / Dark | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| | Blue(1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| Gray | Blue(2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | (|
| Scale | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | |
| of Of | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | |
| Ji Blue | Blue(253) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | |
| Diue | Blue(254) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | (|
| | Blue(255) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |

Note (1) 0: Low Level Voltage, 1: High Level Voltage







6. INTERFACE TIMING

6.1 INPUT SIGNAL TIMING SPECIFICATIONS

The input signal timing specifications are shown as the following table and timing diagram.

| | <u> </u> | | | | | | | |
|-------------------|--------------------------------------|----------------------------|------------------------|---------|------------------------|------|----------------|--|
| Signal | Item | Symbol | Min. | Тур. | Max. | Unit | Note | |
| | Frequency | F _{clkin} (=1/TC) | 60 | 76 | 82 | MHz | | |
| LVDS | Input cycle to cycle jitter | T _{rcl} | _ | _ | 200 | ps | (3) | |
| Receiver Clock | Spread spectrum modulation range | Fclkin_mo | F _{clkin} -2% | _ | F _{clkin} +2% | MHz | (4) | |
| | Spread spectrum modulation frequency | F _{SSM} | | 200 KHz | | KHz | (4) | |
| LVDS Receiver | Setup Time | Tlvsu | 600 | _ | - | ps | (5) | |
| Data | Hold Time | Tlvhd | 600 | _ | _ | ps | (3) | |
| | Frame Rate | F _{r5} | 47 | 50 | 53 | Hz | (6) | |
| Vertical | Tramo riato | F _{r6} | 57 | 60 | 63 | Hz | (0) | |
| Active Display | Total | Tv | 778 | 806 | 888 | Th | Tv=Tvd+Tv b | |
| Term | Display | Tvd | 768 | 768 | 768 | Th | _ | |
| | Blank | Tvb | 10 | 38 | 120 | Th | _ | |
| Horizontal | Total | Th | 1442 | 1560 | 1936 | Tc | Th=Thd+T hb | |
| Active Display | Display | Thd | 1366 | 1366 | 1366 | Tc | _ | |
| Term | Blank | Thb | 76 | 194 | 570 | Tc | _ | |

Note (1) Please make sure the range of pixel clock has followed the below equation :

 $Fclkin(max) \ge Fr6 \times Tv \times Th$

 $Fr5 \times Tv \times Th \ge Fclkin(min)$

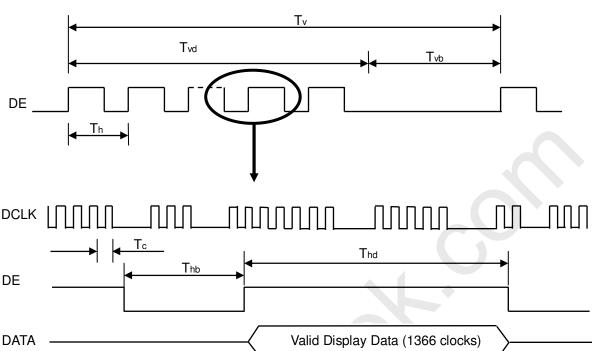
Note (2) This module is operated in DE only mode and please follow the input signal timing diagram as below:



Issued Date: May. 17, 2010 CHIMEI INNOLUX

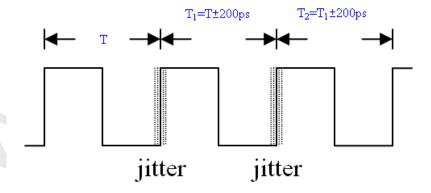
Model No.: V260B3-LE1 **Approval**

INPUT SIGNAL TIMING DIAGRAM



Note (3) The input of the clock cycle-to-cycle jitter is defined as below figure.

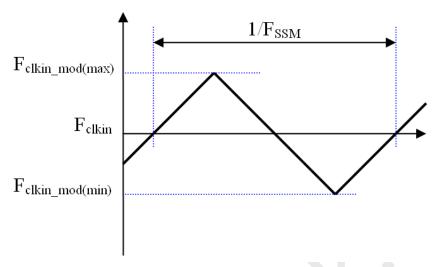
$$Trcl = IT_1 - TI$$





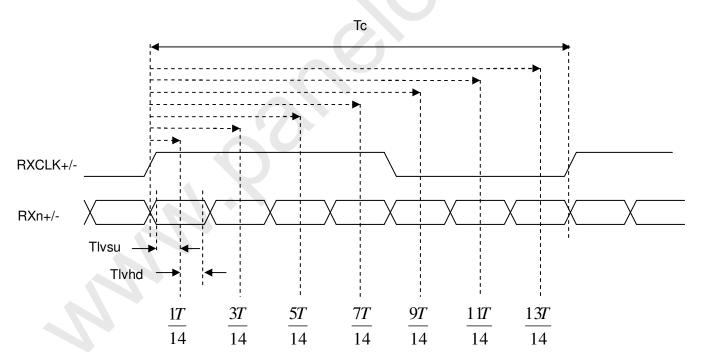


Note (4) The SSCG (Spread Spectrum Clock Generator) is defined as below figure.



Note (5) The LVDS timing diagram and setup/hold time is defined and showing as the following figure.

LVDS RECEIVER INTERFACE TIMING DIAGRAM



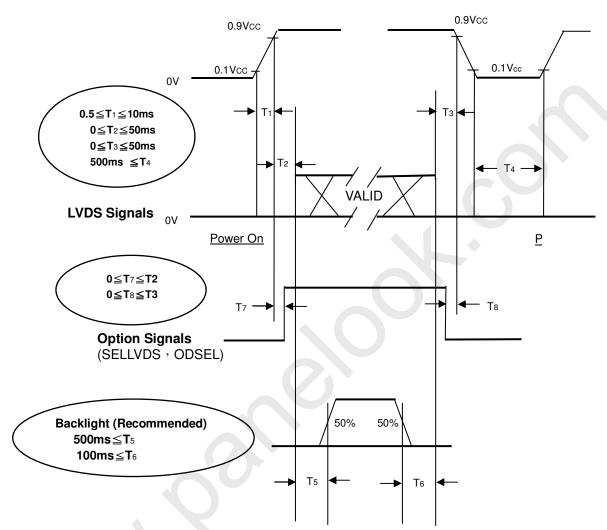
Note (6) (ODSEL) = H/L or open for 50/60 Hz frame rate. Please refer to 5.1 for detail information.



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6.2 POWER ON/OFF SEQUENCE

To prevent a latch-up or DC operation of LCD module, the power on/off sequence should obey the diagram plotted as below.



Power ON/OFF Sequence

- Note (1) The supply voltage of the external system for the module input should follow the definition of Vcc.
- Note (2) Apply the LED voltage within the LCD operation range. When the backlight is turned on before the LCD operation or the LCD turns off before the backlight has been turned off, the display may momentarily become abnormal screen.
- Note (3) In the case of Vcc is in off level, please maintain the level of input signals on the low or high impedance. If T2<0, that maybe cause electrical overstress failure.
- Note (4) T4 should be measured after the module has been fully discharged between power off and on period.
- Note (5) Interface signal shall not be kept at high impedance when the power is on.





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7. OPTICAL CHARACTERISTICS

7.1 TEST CONDITIONS

| Item | Symbol | Value | Unit | | |
|---------------------|---|--------|------|--|--|
| Ambient Temperature | Ta | 25±2 | °C | | |
| Ambient Humidity | На | 50±10 | %RH | | |
| Supply Voltage | V_{CC} | 12V | V | | |
| Input Signal | According to typical value in "3. ELECTRICAL CHARACTERISTICS" | | | | |
| LED Current | I_L | 80±4.8 | mA | | |

7.2 OPTICAL SPECIFICATIONS

The relative measurement methods of optical characteristics are shown in 7.2. The following items should be measured under the test conditions described in 7.1 and stable environment shown in Note (6).

| Ite | em | Symbol | Condition | Min. | Тур. | Max. | Unit | Note |
|-----------------------|--------------|----------------|---|---------------|-------|------|--------|------|
| Contrast Ratio | | CR | | 2000 | 3000 | | - | (2) |
| Response Time | | Gray to Gray | | | 8.5 | 14 | ms | (3) |
| Center Lumina | nce of White | L _C | | 320 | 400 | | | (4) |
| White Variation | า | δW | | | | 1.3 | - | (7) |
| Cross Talk | | CT | $\theta_x=0^\circ$, $\theta_Y=0^\circ$ | | | 4 | % | (5) |
| Color Chromaticity | Red | Rx | Viewing Normal | | 0.633 | | - | |
| | | Ry | Angle | Typ. -0.03 | 0.334 | Typ | - | (6) |
| | Green | Gx | | | 0.301 | | - | |
| | | Gy | | | 0.630 | | - | |
| | Blue | Bx | | | 0.153 | | - | |
| | | Ву | | | 0.057 | | - | |
| | White | Wx | | | 0.280 | | Target | |
| | | Wy | | | 0.290 | | larget | |
| | Color Gamut | CG | | | 72 | | % | NTSC |
| Viewing Angle | Horizontal | θ_{x} + | CR≥20 | 80 | 88 | | Deg. | (1) |
| | | θ_{x} - | | 80 | 88 | | | |
| | Vertical | θγ+ | | 80 | 88 | | | |
| | | θ_{Y} - | | 80 | 88 | | | |

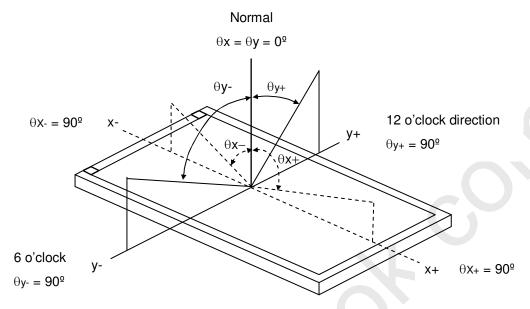




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Note (1) Definition of Viewing Angle (θx , θy):

Viewing angles are measured by Autronic Conoscope Cono-80



Note (2) Definition of Contrast Ratio (CR):

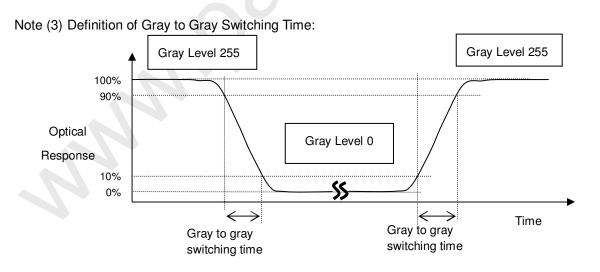
The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L255 / L0

L255: Luminance of gray level 255

L 0: Luminance of gray level 0

CR = CR (5), where CR (X) is corresponding to the Contrast Ratio of the point X in the figure of Note (7).



The driving signal means the signal of luminance 0%, 20%, 40%, 60%, 80%, and 100%.

Gray-to-Gray average time means the average switching time of luminance 0%, 20%, 40%, 60%, 80%, and 100% to each other.

Global LCD Panel Exchange Center

Issued Date: May. 17, 2010 Model No.: V260B3-LE1





Note (4) Definition of Luminance of White (L_C):

Measure the luminance of gray level 255 at center point.

L_C = L (5), where L (x) is corresponding to the luminance of the point X in the figure of Note (7).

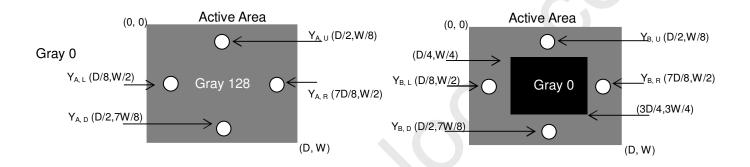
Note (5) Definition of Cross Talk (CT):

$$CT = | Y_B - Y_A | / Y_A \times 100 (\%)$$

Where:

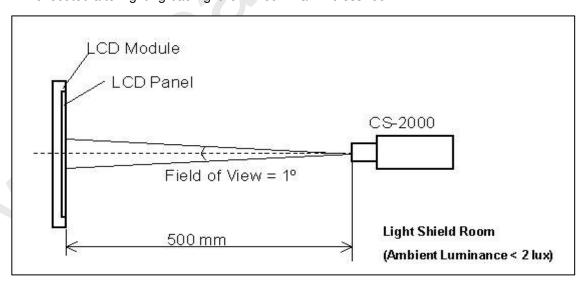
 Y_A = Luminance of measured location without gray level 0 pattern (cd/m²)

Y_B = Luminance of measured location with gray level 0 pattern (cd/m²)



Note (6) Measurement Setup:

The LCD module should be stabilized at given temperature for 1 hour to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 1 hour in a windless room.





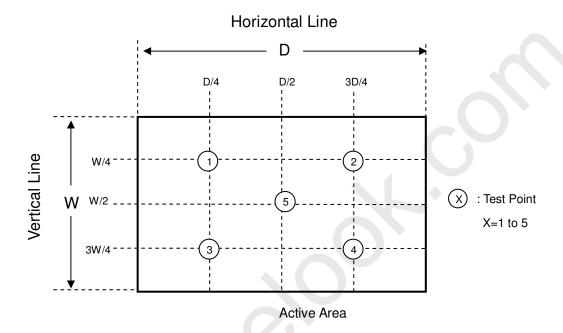


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Note (7) Definition of White Variation (δW):

To measure the luminance of gray level 255 at 5 points

 $\delta W = Maximum [L (1), L (2), L (3), L (4), L (5)] / Minimum [L (1), L (2), L (3), L (4), L (5)]$





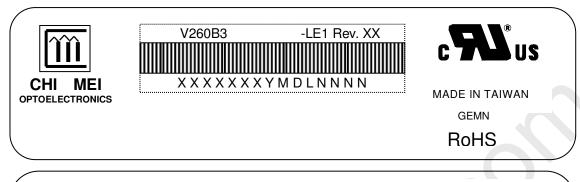


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8. DEFINITION OF LABELS

8.1 CMO MODULE LABEL

The barcode nameplate is pasted on each module as illustration, and its definitions are as following explanation.



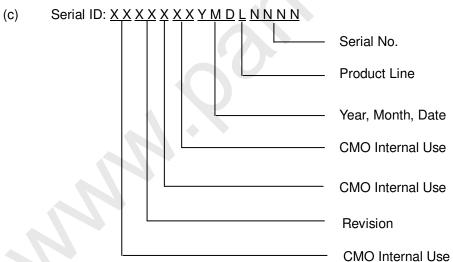




MADE IN CHINA
LEOO(or CAPG or CANO)
ROHS

(a) Model Name: V260B3-LE1

(b) Revision: Rev. XX, for example: A0, A1... B1, B2... or C1, C2...etc.



Serial ID includes the information as below:

(a) Manufactured Date: Year: 0~9, for 2010~2019

Month: 1~9, A~C, for Jan. ~ Dec.

Day: 1~9, A~Y, for 1st to 31st, exclude I,O, and U.

(b) Revision Code: Cover all the change

(c) Serial No.: Manufacturing sequence of product

(d) Product Line: 1 -> Line1, 2 -> Line 2, ...etc.



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9. PACKAGING

9.1 PACKING SPECIFICATIONS

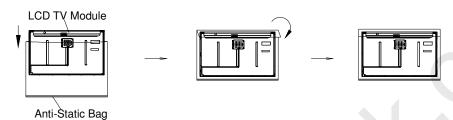
(1) 11 LCD TV modules / 1 Box

(2) Box dimensions : 698(L)x436(W)x452(H)mm

(3) Weight: approximately 31.7 Kg (11 modules per box)

9.2 PACKING METHOD

Figures 9-1 and 9-2 are the packing method



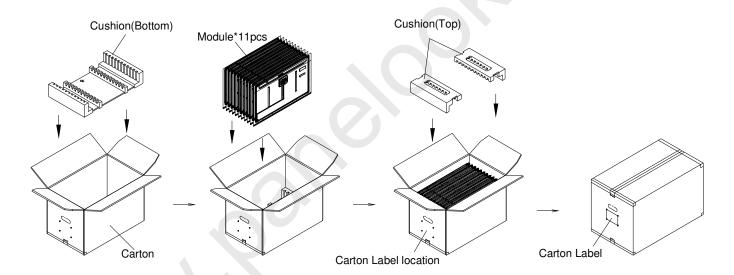


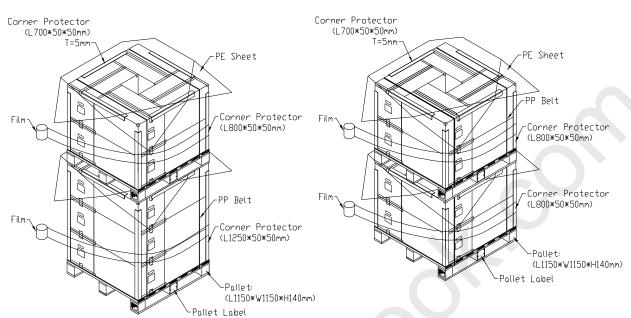
Figure 9-1 packing method



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Sea / Land Transportation (40ft HQ Container)

Sea / Land Transportation (40ft Container)



Air Transportation

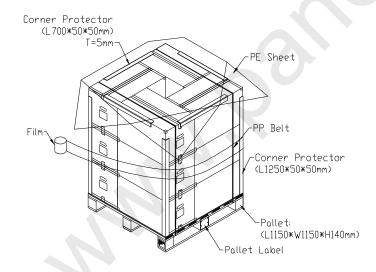


Figure 9-2 Packing method





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10. PRECAUTIONS

10.1 ASSEMBLY AND HANDLING PRECAUTIONS

- (1) Do not apply rough force such as bending or twisting to the module during assembly.
- (2) It is recommended to assemble or to install a module into the user's system in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
- (3) Do not apply pressure or impulse to the module to prevent the damage of LCD panel and backlight.
- (4) Always follow the correct power-on sequence when the LCD module is turned on. This can prevent the damage and latch-up of the CMOS LSI chips.
- (5) Do not plug in or pull out the I/F connector while the module is in operation.
- (6) Do not disassemble the module.
- (7) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (8) Moisture can easily penetrate into LCD module and may cause the damage during operation.
- (9) High temperature or humidity may deteriorate the performance of LCD module. Please store LCD modules in the specified storage conditions.
- (10) When ambient temperature is lower than 10°C, the display quality might be reduced. For example, the response time will become slow, and the starting voltage of CCFL will be higher than that of room temperature.

10.2 SAFETY PRECAUTIONS

- (1) The startup voltage of a backlight is over 1000 Volts. It may cause an electrical shock while assembling with the inverter or converter. Do not disassemble the module or insert anything into the backlight unit.
- (2) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (3) After the module's end of life, it is not harmful in case of normal operation and storage.

10.3 STORAGE PRECAUTIONS

When storing modules as spares for a long time, the following precaution is necessary.

- (1) Do not leave the module in high temperature, and high humidity for a long time.
 It is highly recommended to store the module with temperature from 0 to 35°C at normal humidity without condensation.
- (2) The module shall be stored in dark place. Do not store the TFT-LCD module in direct sunlight or fluorescent light.





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11. REGULATORY STANDARDS

11.1 SAFETY

The LCD module should be certified with safety regulations as follows:

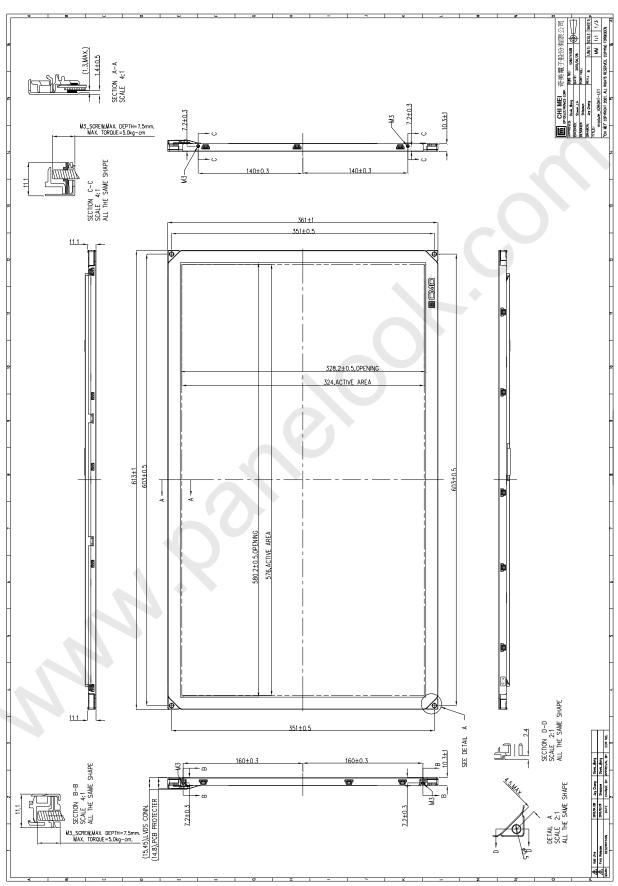
| Requirement | Standard | Remark |
|-------------|--|--------|
| UL | UL60950-1:2006 or Ed.2:2007 | |
| | UL60065 Ed.7:2007 | |
| cUL/CSA | CAN/CSA C22.2 No.60950-1-03 or 60950-1-07 | |
| | CAN/CSA C22.2 No.60065-03:2006 + A1:2006 | |
| СВ | IEC60950-1:2005 / EN60950-1:2006+ A11:2009 | |
| | IEC60065:2001+ A1:2005 / EN60065:2002 + A1:2006 + A11:2008 | |







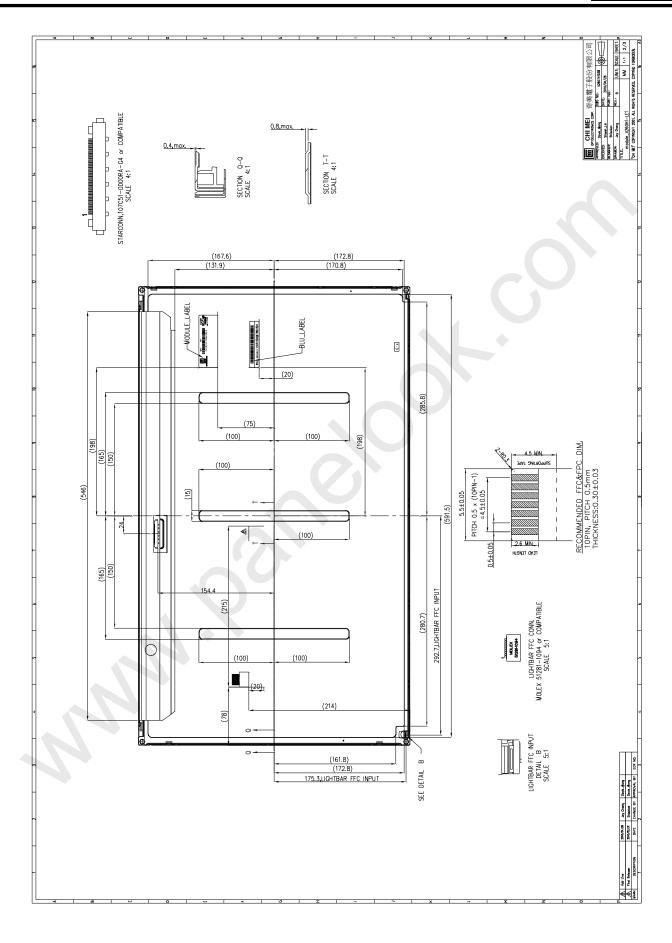
12. MECHANICAL CHARACTERISTIC













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